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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/702,185	10/30/2000	Shirley Lee	10982031-1	1662

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EXAMINER

SHOSHO, CALLIE E

ART UNIT	PAPER NUMBER
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1714

17

DATE MAILED: 01/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/702,185

Applicant(s)

LEE ET AL.

Examiner

Callie E. Shosho

Art Unit

1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 18 November 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-17, 21-27, 30, 32 and 34-57 is/are pending in the application.
- 4a) Of the above claim(s) 1-16 and 34-49 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 17, 21, 23-27, 30, 32, 50 and 52-57 is/are rejected.
- 7) ☐ Claim(s) 22 and 51 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/18/02 has been entered.

Election/Restrictions

2. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-16, drawn to ink jet printing apparatus, classified in class 347, subclass 98.
 - II. Claims 17, 21-27, 30, and 32, drawn to ink jet ink/underprinting fixer fluid, classified in class 523, subclass 160.
 - III. Claims 34-49, drawn to method of ink jet printing, classified in class 524, subclass 548.
3. The inventions are distinct from each other because:
 - (a) Inventions III and I are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case, the

apparatus as claimed can be practiced by another and materially different process such as printing ink first then fixer fluid or printing several different color inks with no printing of fixer fluid.

(b) Inventions II and III are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case, the process as claimed can be practiced with another materially different product such as underprinting fixer fluid comprising at least one anionic component and ink composition comprising at least one cationic component or two ink compositions, i.e. no fixer fluid.

(c) Inventions I and II are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions have different functions and effects. The invention of Group II is drawn to an ink jet ink/underprinting fixer fluid composition while the invention of Group I is drawn to an ink jet printing apparatus which uses the ink/fixer fluid and thus, the inventions are not related as apparatus and product made. The inventions have different functions because the ink/fixer fluid are compositions used as coating to produce fixed printed image on a substrate, while the apparatus is a device used to store and then eject ink. The inventions have different effects

because the effect of the ink/fixer fluid is to produce a visible and/or readable image on a substrate, while the effect of the apparatus is to transfer ink from the printer to the substrate.

4. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification and/or recognized divergent subject matter, restriction for examination purposes as indicated is proper.

5. During a telephone conversation with Michael Jones on 2/7/02 a provisional election was made with traverse to prosecute the invention of Group II (**NOTE:** while the specification as originally filed included claims 17-33, given that some claims have been cancelled by applicants' amendment filed 4/25/02, Paper No. 8, it is noted that the claims set forth with respect to Group II in paragraph 2 above reflect these changes).

In the office action mailed 8/19/02, applicant's election of Group II, in Paper No. 8 was acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). Further, claims 1-16 and 34-49 were withdrawn from further consideration by the examiner, 37 CFR 1.142(b) as being drawn to a non-elected invention. Election was made without traverse in Paper No.8.

Further, claims 50-57, newly added as set forth in the amendment filed 4/25/02, Paper No. 8, were joined with elected Group II.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

7. Claims 17, 21, 23-27, 32, 50, 52-55, and 57 are rejected under 35 U.S.C. 102(a) as being anticipated by Watanabe et al. (U.S. 6,070,229).

Watanabe et al. disclose an ink composition comprising anionic dye, i.e. Acid dye, and anionic polymer obtained from monomers including acrylate and styrene wherein the ink is printed on a medium over an underprinted fixer fluid, i.e. liquid composition, comprising cationic compound and polyvalent metal salt. The cationic compounds include quaternary ammonium salt type compounds of the formula $R^1R^2R^3R^4N^+X^-$ while the polyvalent metal salt provides cations such as calcium, aluminum, barium, and magnesium. It is further disclosed that the ink also contains low molecular weight hydrophilic compounds including lower alcohols (col.2, lines 46-56, col.3, lines 36-46, col.6, line 65-col.7, line 15, col.18, lines 56-59, col.9, lines 48-50, col.10, lines 65-67, and col.11, lines 45 and 64-67).

Although there is no explicit disclosure that the printed ink and fixer fluid together form an amorphous, viscous fluid with viscosity greater than the ink, given that Watanabe et al. disclose ink and fixer fluid identical to that presently claimed including anionic dye and cationic component which will react or associate with each other, it is clear that the mixture of the ink

and fixer fluid will inherently produce an amorphous, viscous fluid with viscosity as presently claimed.

In light of the above, it is clear that Watanabe et al. anticipate the present claims.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 17, 23-27, 32, 52-55, and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kurabayashi et al. (U.S. 5,700,314) or Takahashi et al. (U.S. 5,624,484) either of which in view of Watanabe et al. (U.S. 6,080,229).

Kurabayashi et al. disclose an ink composition comprising anionic dye and anionic high molecular weight substance such as sodium polyacrylate or copolymer obtained from monomers including acrylic acid wherein the ink is printed on a medium over an underprinted fixer fluid, i.e. liquid composition, comprising cationic compound. The anionic dye includes those with sulfonated or carboxylate groups. The cationic compounds include quaternary ammonium salt type compounds. It is further disclosed that the ink also contains low molecular weight hydrophilic compounds including lower alcohols (col.5, lines 9-26 and 33-34, col.7, lines 30-45, col.8, lines 47-49, and col.9, lines 59-64).

Although there is no explicit disclosure that the printed ink and fixer fluid together form an amorphous, viscous fluid with viscosity greater than the ink, given that Kurabayashi et al. disclose ink and fixer fluid identical to that presently claimed including anionic dye and cationic component which will react or associate with each other, it is clear that the mixture of the ink and fixer fluid will inherently produce an amorphous, viscous fluid with viscosity as presently claimed.

Alternatively, Takahashi et al. disclose an ink composition comprising anionic dye and anionic polymer substance such as sodium polyacrylate and copolymer obtained from acrylic

acid wherein the ink is printed on a medium over an underprinted fixer fluid, i.e. liquid composition, comprising cationic compound. The anionic dye includes those with carboxylate groups. The cationic compounds include quaternary ammonium salt type compounds. It is further disclosed that the ink also contains low molecular weight hydrophilic compounds including lower alcohols (col.3, lines 62-67, col.5, line 67, col.8, lines 21-28 and 44-45, and col.11, lines 55-65).

Col.4, lines 19-25 of Takahashi et al. disclose that upon reaction between the anionic dye in the ink and the cationic component in the fixer fluid, the viscosity increases. Although there is no explicit disclosure that the printed ink and fixer fluid together form an amorphous, viscous fluid with viscosity greater than the ink, given that Takahashi et al. disclose ink and fixer fluid identical to that presently claimed including anionic dye and cationic component which will react or associate with each other, it is clear that the mixture of the ink and fixer fluid will inherently produce an amorphous, viscous fluid with viscosity as presently claimed.

The difference between Kurabayashi et al. or Takahashi et al. and the present claimed invention is the requirement in the claims of cations.

Watanabe et al., which is drawn to ink jet ink and fixer fluid, disclose the use of polyvalent metal salt which provides cations such as calcium, aluminum, barium, and magnesium to the fixer fluid as presently claimed (col.3, lines 36-46) wherein the motivation for using such salts is that the salts react with the colorant present in the ink in order to prevent bleeding and produce an image with high color density and free from feathering (col.2, line 57-col.3, line 5).

In light of the motivation for using polyvalent metals salts disclosed by Watanabe et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such salt in the fixer fluid of either Kurabayashi et al. or Takahashi et al. in order to produce fixer fluid which prevents bleeding and produce an image with high color density and free from feathering, and thereby arrive at the claimed invention.

11. Claims 30 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kurabayashi et al. or Takahashi et al. either of which in view of Watanabe et al. as applied to claims 17, 23-27, 32, 52-55, and 57 above, and further in view of Yatake (U.S. 6,004,389).

The difference between Kurabayashi et al. or Takahashi et al. either of which in view of Watanabe et al. and the present claimed invention is the requirement in the claims of cationic polymer which comprises branched polymer chains.

Yatake, which is drawn to ink jet ink and fixer fluid, disclose the use of polyethyleneimine, an intrinsically branched cationic polymer, in the fixer fluid wherein the polyethyleneimine reacts with the colorant in the ink composition in order to prevent bleed of the ink (col.1, line 13 and col.16, lines 40-43 and 48). Additionally, Yatake disclose the equivalence and interchangeability of polyallylamine, as disclosed by either Kurabayashi et al. (col.6, line 22) or Takahashi et al. (col.4, line 22) with polyethyleneimine as the cationic compound in the fixer fluid.

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use cationic polymer which comprises branched polymer chains, i.e. polyethyleneimine, in

the fixer fluid of either Kurabayashi et al. or Takahashi et al. in order to produce fixer fluid which prevents ink bleed, and thereby arrive at the claimed invention.

Allowable Subject Matter

12. Claims 22 and 51 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 22 and 51 would be allowable over the "closest" prior art, if re-written in independent form as described above, for the following reasons:

Kurabayashi et al. and Takahashi et al. each disclose ink comprising anionic dye and anionic polymer which is printed on substrate over underprinted fixer fluid which comprises cationic compound. However, there is no disclosure or suggestion in either reference of hydrolyzed styrene-maleic anhydride binder as presently claimed.

Zhu (U.S. 5,889,083) and EP 735120 disclose the use of hydrolyzed styrene-maleic anhydride in ink jet ink in order to fix the colorant to the substrate. However, as set forth on page 2 of the amendment filed 11/18/02 as well as pages 1-2 of the 1.132 declaration filed 11/18/02, in the present invention and in Kurabayashi et al. or Takahashi et al., the anionic polymer and anionic dye present in the ink react with the cationic compound present in the fixer fluid. Therefore, the cationic fixer fluid would interfere with ability of the hydrolyzed styrene-maleic anhydride disclosed by either Zhu or EP 735120 to bind the colorant or ink to the substrate since the hydrolyzed styrene-maleic anhydride would bind the cations in the fixer fluid instead. Thus, given that the presence of cationic fixer fluid in either Kurabayashi et al. or Takahashi et al.

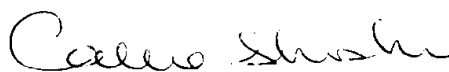
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would interfere with the function of the hydrolyzed styrene-maleic anhydride disclosed by either Zhu or EP 735120 to bind the colorant or ink to the substrate, there is no motivation to combine either Kurabayashi et al. or Takahashi et al. with Zhu or EP 735120.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 703-305-0208. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 703-306-2777. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Callie E. Shosho
Examiner
Art Unit 1714

CS
January 22, 2003